Conley Composites
an ANDRONACO INDUSTRIES company

EPOXY SCHEDULE 90M-JF MARINE & OFFSHORE PIPING

ASTM DESIGNATION CODE RTRP-11FT1-2113

Conley Piping Specification

1.0 SCOPE

1.1 This specification covers requirements for machine made reinforced thermosetting resin pipe and fittings, 1" - 20", manufactured according to ASTM D 2996 or ASTM F 1173 or IMO A.753(18), the standard specification for filament wound pipe used in marine and offshore piping systems. These specifications shall cover Schedule 90M-JF Jet-Fire Endurance Rated extra heavy duty pressure and process pipe and fittings, firewater deluge and seawater piping for use with a broad base of marine applications.

Both Pipe and Fittings (Tees, Elbows, Reducers, and Crosses) shall be manufactured with a minimum double Nexus® (synthetic veil) reinforced Epoxy internal corrosion barrier, an Epoxy filament wound fiberglass reinforced cage, a standard Nexus® reinforced external corrosion barrier, and an external epoxy intumescent fire proof coating. ***Schedule 90M-JF Piping is tested by Southwest Research Institute in accordance with the Offshore Technology Report OTI 95 634, "Jet-Fire Resistance Test of Passive Fire Protection Materials," 1996. See the Conley Marine Piping Catalog for a complete listing of all Type Approvals.*** **Pipe and fittings have a 25 year guarantee against ultraviolet (UV) degradation (fiber blooming).** See the ***Conley Product Data*** for pressure/temperature ratings and span dimensions of each schedule.

2.0 MATERIAL

2.1 Raw materials will meet or exceed specifications for Epoxy resin systems and fiberglass materials.

2.2 The resin, reinforcement, pigments, fillers and other materials, when combined as a composite structure shall produce a pipe that shall meet or exceed the requirements of the classification system listed in ASTM D 2310.

3.0 PIPE CONSTRUCTION

3.1 The pipe shall consist of three specific layers and a final fire protective coating; the minimum double Nexus® synthetic veil reinforced ***internal corrosion barrier***, the filament wound reinforcement or ***cage,*** and the Nexus® synthetic veil reinforced ***external corrosion*** / UV barrier. Finally, the pipe is encapsulated by an epoxy intumescent coating for fire resistance. This material shall then be post-cured using standard Conley curing methods for Epoxy piping with fire coating to form an integral structure and provide optimum cross-linking density.

3.1a The 60 mil ***internal corrosion barrier*** (inner liner) shall consist of a minimum two layers of Nexus® synthetic veil saturated with aromatic amine cured premium Epoxy resin. This layer shall be a maximum of 90% resin and 10% reinforcement to increase impact, abrasion, and chemical resistance.

3.1b The glass reinforcement, or cage, shall be continuous glass roving wound at an angle of 54 3/4 degrees to the longitudinal axis of the pipe, using aromatic amine cured premium Epoxy resin, and shall be not less than 65% glass for maximum strength and flexibility.

3.1c The external corrosion barrier will be Nexus® synthetic veil reinforced for corrosion resistance, impact, abrasion, and UV resistance. This is required to control the OD for straight socket design connections.

3.1d The external corrosion barrier shall be encapsulated in an epoxy intumescent fire protective coating tested in accordance with the Offshore Technology Report OTI 95 634, “Jet-Fire Resistance Test of Passive Fire Protection Materials,” 1996. The intumescent coating color may be pigmented (impregnated) without painting if so specified. Some colors and shades may not be achievable.

4.0 FITTINGS

4.1 All fittings such as elbows, laterals, tees and reducers shall be equal or superior in strength to the adjacent pipe section and shall have the same internal diameter as the pipe. ***Fittings shall be filament wound, and have the same three layer construction as the pipe, i.e., 60 mil Nexus® synthetic veil reinforced internal corrosion resistant barrier, filament wound and glass reinforced structural cage, and a Nexus® synthetic veil reinforced external corrosion barrier with standard 25 year guarantee against UV degradation (fiber blooming), and an epoxy intumescent fire protective coating.***

4.2 Elbows - Manufactured in standard configurations with straight socket ends designed for the controlled OD of the pipe.

4.3 Reducers - Designed as concentric or eccentric gradual changes in diameter to minimally affect the fluid flow, and manufactured with straight socket ends.

5.0 CONNECTIONS

5.1 Prefabrication - When requested by the customer, the manufacturer shall prefabricate into shippable sub-assemblies to minimize the use of field-fabricated connections.

5.2 Straight Cement Socket Joints - Shall be used with both pipe to fitting connections as well as pipe to pipe connections using a coupling. Tapering or machining of the pipe shall not be allowed. Field fabricated joints shall be coated with intumescent fire protective coating after the adhesive has cured.

5.3 Flange connections - Shall be used to join the fiberglass pipe and fittings to other equipment. Flanges shall be designed for the operating pressure per the line requirements as a minimum. Flange dimensions shall conform to ANSI/ASME B16.5 150 lb drilling. Where flanges connect to raised face surfaces (valves, etc.), a spacer ring shall be added to achieve a flat mating surface.

5.4 Gasket material - For flanged connections this shall be an elastomer which is compatible with the service. Teflon and Teflon envelope gaskets are not recommended. See 9.5.

6.0 STRAIGHT SOCKET CEMENT JOINTS

6.1 This type of joint shall be the only means of joining pipe to pipe and fittings. Tapering or machining of the pipe shall not be allowed, nor shall butt wrap joints. Pipe to pipe connections shall be made with straight socket cement couplings. The only exception to this specification shall be

flanged connections as described in 5.3.

7.0 Flanges

7.1 Flange Attachment - Flanges shall be attached to a pipe section only with straight socket cement joints.

7.2 Flange Face - Flanges through 12” diameter shall be grooved to allow use of a full face gasket, flanges larger than 12” shall be non-grooved. Full face gaskets are required.

8.0 PRESSURE AND VACUUM SERVICE

8.1 Series 90 pipe and fittings are available in 150, 225, or 250 psi internal pressure rating. The piping systems have a minimum Full Vacuum rating for installation in ballast systems. Other internal pressure and external pressure (vacuum) ratings are available.

9.0 RECOMMENDED INSTALLATION PRACTICE

9.1 Pipe hangers and spacing - Hangers shall be band type hangers contacting a minimum of 120 degrees of the pipe surface, and with a minimum width of 1" or pipe diameter divided by 6, whichever is greater.

9.2 Underground Installation - The pipe shall be designed for burial of 3 feet to 20 feet under standard soil and bedding conditions. Manufacturer shall design pipe for required burial conditions.

9.3 Expansion - The manufacturer shall specify thermal loads, expansion and contraction, and shall convey this design information to the end user or customer for consideration in the proper design of the piping system.

9.4 Bolts, Nuts, and Washers - Bolts, nuts, and washers shall be furnished by the customer. Metal SAE washers shall be used under all nut and bolt heads. All nuts, bolts and washers shall be of materials suitable for use in the exterior environment.

9.5 Gaskets - Gaskets shall be furnished by the customer. Recommended gasket materials shall be a minimum of 1/8 inch in thickness with a suitable chemical resistance to the service environment. Gaskets shall have a Shore A hardness of 50 to 70. ***See the Conley Installation and Fabrication Manual for bolt torque requirements.***

9.6 Fabrication - Fabrication procedures and certification of fabricators shall be in accordance with ***the Conley Installation and Fabrication Manual****, Conductive Piping.*

10.0 QUALITY ASSURANCE AND INSPECTION

10.1 Conley’s Quality Assurance program is in compliance with ISO 9001. Pipe and fittings shall be inspected and measured at each stage of manufacture, i.e. liner, reinforcement and external corrosion barrier. For optimum strength and corrosion resistance, all pipe and fittings shall be post cured.

ISO 9001:2008
CERTIFIED
Conley
Composites
Tulsa, Oklahoma
USA

Conley Composites
an ANDRONACO INDUSTRIES company
2795 East 91st Street
Tulsa, Oklahoma 74137 USA
Phone: (918) 299-5051
Fax: (918) 299-5907
www.conleyfrp.com
E-Mail:
sales@conleyfrp.com